

**Notice of Allowability**

Application No.

10/669,616

Examiner

Rodney G. McDonald

Applicant(s)

MILLER, BRIAN

Art Unit

1753

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Amendment filed 5-9-06.
2. ☒ The allowed claim(s) is/are 1-3,6,7,10-14,17,19-22 and 24-30.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All   b) ☐ Some\*   c) ☐ None   of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.


Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  5. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08),  
Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit  
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_.

  
**RODNEY G. MCDONALD**  
**PRIMARY EXAMINER**

### **REASONS FOR ALLOWANCE**

The following is an examiner's statement of reasons for allowance:

Claims 1-3 are allowable over the prior art of record because the prior art of record does not teach a method for removing a material covering an alignment on a substrate including directing a non-liquid metal ion beam at the material covering an alignment mark, the ion beam having a beam current greater than 300 nanoamps and directed at an oblique angle relative to the surface of the substrate; and removing the material by ion beam sputtering, the ion beam maintaining a substantially identical oblique angle relative to the surface of the substrate while material is removed by ion beam sputtering.

Claims 6, 7, 10-13 and 30 are allowable over the prior art of record because the prior art of record does not teach a method for removing material covering an alignment mark on a substrate including directing a focused ion beam of noble gas ions at the material covering an alignment mark; the focused ion beam being directed at the substrate at an angle of between 40 degrees and 80 degrees relative to the substrate surface normal; and removing the material by charged particle beam sputtering without using an etch assisting gas.

Claims 14, 17 and 19-22 are allowable over the prior art of record because the prior art of record does not teach an apparatus for removing a material covering an alignment mark on a substrate including a noble gas ion beam system having a noble gas ion source suitable for emitting a noble gas ion beam, the source oriented at an oblique angle relative to the substrate surface normal, an optical system to focus the

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noble gas ion beam, and a computer controlled beam deflector to portion the noble gas ion beam and computer accessible memory having computer instructions for directing a charge particle beam at material covering an alignment mark; and removing the material by charged particle beam sputtering.

Claims 24-29 are allowable over the prior art of record because the prior art of record does not teach a method for removing a material covering an alignment mark on a substrate including directing a non-liquid metal ion beam at the material covering an alignment mark, the ion beam having a beam current greater than 300 nanoamps and the optical axis forming an oblique angle relative to the substrate surface normal; and removing the material by ion beam sputtering without using an etch assisting gas.

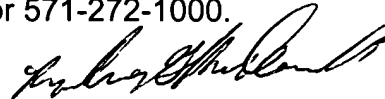
The closest prior art of record fails to teach utilizing a non-liquid metal or noble gas ion source for sputtering material to expose the alignment mark. Furthermore, the closest prior art of record fails to disclose utilizing the beam current limitations of the claims for the ion source for sputtering material to expose the alignment mark. Furthermore, the closest prior art of record fails to disclose an oblique angle for sputtering material to expose the alignment mark.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney G. McDonald whose telephone number is 571-272-1340. The examiner can normally be reached on M- Th with Every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Rodney G. McDonald  
Primary Examiner  
Art Unit 1753

RM  
July 31, 2006